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Phy101 Physics I
Quiz4-Motion in Two and Three Dimensions
October 26-27, 2026 15:00 & 10:00
Good Luck!

◇ Open Source Quiz
◇ Answer all the questions. Write the solutions explicitly and clearly. Use the physical terminology
◇ Calculator is allowed. You are not allowed to use any other electronic equipment in the exam

1. A) Determine the acceleration of the moon toward the earth, using values for its mean distance as $3.84 \times 10^8\ m$ and orbital period as 27.3 *day*. Assume a circular orbit. Express the acceleration as a fraction of the magnitude of free-fall acceleration g.

   B) A ball thrown into the air lands 40 m away 2.44 s later. Find the direction and magnitude of the initial velocity.

2. A) A centrifuge spins at a rate of 15,000 rev/min.

      i Calculate the centripetal acceleration of a test-tube sample held in the centrifuge arm 15 cm from the rotation axis

      ii It takes 1 min, 15 s for the centrifuge to spin up to its maximum rate of revolution from rest. Calculate the magnitude of the tangential acceleration of the centrifuge while it is spinning up, assuming that the tangential acceleration is constant.

   B) A projectile is fired with an initial speed of 53 m/s. Find the angle of projection such that the maximum height of the projectile is equal to its horizontal range.